

PLANT PROFILE

Cyathea exilis Holttum (Pteridophyta: Cyatheaceae)

Cyathea exilis is a slender treefern discovered on Cape York Peninsula in 1983 by members of an Australian Orchid Foundation-sponsored expedition (Lavarack 1984), and described by R.E. Holttum in 1986. Neither the original publication nor the reference to the species in Appendix 2 of Andrews' Ferns of Queensland (1990) was accompanied by an illustration. This plant profile is intended to remedy that omission, and it also is dedicated to the memory of Prof. Holttum, who contributed so much to the taxonomy of the ferns, and to our knowledge of *Cyathea* in particular. Richard Eric Holttum died on 18 September 1990 at the age of 95.

In the description which follows, measurements enclosed in square brackets are those of the type description, where they differ from those of specimens examined by me. The discrepancies are considered to originate from the small number of specimens which have been collected.

Cyathea exilis Holttum, Kew Bulletin 41: 532 (1986). **Type:** Queensland. COOK DISTRICT: Cape York Peninsula, William Thompson Range, Hann ['Mann'] Ck, growing with *Pandanus* and *Calamus* in swamp by the stream, September 1983, D.L. Jones *et al.* 1212 (holo: K, *n.v.*; iso: BRI!; CBG,NSW).

Trunk erect, to 2 [4] m tall and up to 4 [6] cm diameter (excluding basal root-mass), bearing proliferous buds, each bud in a more or less constant position in relation to an adjacent frond base. Stipes to 40 [20] cm long, rising vertically against the trunk for some distance, invested with narrowly conical spinules; spinules 0.5–1.5(–2.2) mm long, surmounted at their apices by narrow, deciduous, dark brown scales up to 1 cm long; stipe scales many cells thick near the base and \pm peltately attached to the spinule, the scale margins pale, brittle and sparsely setose. Lamina 80–100 cm long, ovate, herbaceous, the basal pinnae reflexed in life and c. 21 [18] cm long, the largest pinnae to 31 cm long; rachises smooth below, with a few narrow, brown scales, grooved above, the groove densely clothed with brown, uniseriate hairs. Pinnules 5–5.5 cm long, 1.2–1.5 cm wide, deeply lobed, the lobes 2–3 mm wide, crenate, departing at an angle of 45–60° to the rachis, bearing up to 7 pairs of veins, these once forked for the most part in fertile pinnules; sterile pinnules usually slightly larger than fertile pinnules; rachises smooth, the upper surfaces clothed with hairs similar to those of the primary rachis, the lower surfaces with a few very narrow scales toward the base (the larger scales brown and apically setiferous, the smaller ones pale and not setiferous), with small, strongly bullate, pallid scales towards the apex of the pinnules and on the veinlets of the lobes. Sori, except the lowest ones, submedial, placed on or just below the fork of the veins, exindusiate, with distally flexuous paraphyses 200–395 μ m long; sporangia c. 200 μ m long, on a very short stalk. Mature spores not seen. **Fig. 1.**

Specimens examined: Queensland. COOK DISTRICT: Maloney's Springs, Hann Creek, 12°28'S, 142°56'E, Jul 1988, Forster *et al.* 4525 (BRI,NSW,CANB, to be distributed); cultivated plant, collected Jul 1988, sampled Mar 1990, Kenning s.n. (BRI, in spirit only).

Distribution and habitat: This rare treefern is known at present from only one population of a few dozen individuals at the type locality, at an altitude of c. 150 m, on northern Cape York Peninsula; the habitat is dense notophyll palm vinehicket (Webb 1978), a type of closed forest scattered along the eastern coast and adjacent hinterland of Cape York Peninsula. Movement within the forest is difficult and often unpleasant because of the very high density of *Calamus* and *Freycinetia* stems. Plants of *Cyathea exilis* grow on rocks or hummocks in swampy conditions on the floor of the basin carved from the surrounding sandstone plateau. The humidity is high even in the dry season (June to December or January). Associated ferns include *Cyathea rebecca*, *C. felina*, *Angiopteris evecta* and *Taenitis blechnoides*.

Conservation status: The suggested code is 2E (Briggs & Leigh 1988), in view of the small population and very restricted distribution. The vineforest at the type locality covers an estimated area of 80–100 hectares.

Notes: In his discussion accompanying the type description, Holttum quotes Jones' suggestion that the fern is a rheophyte. I would rather describe it as a 'hydrophyte', to avoid the implication of dependence on running water that the former term invokes.

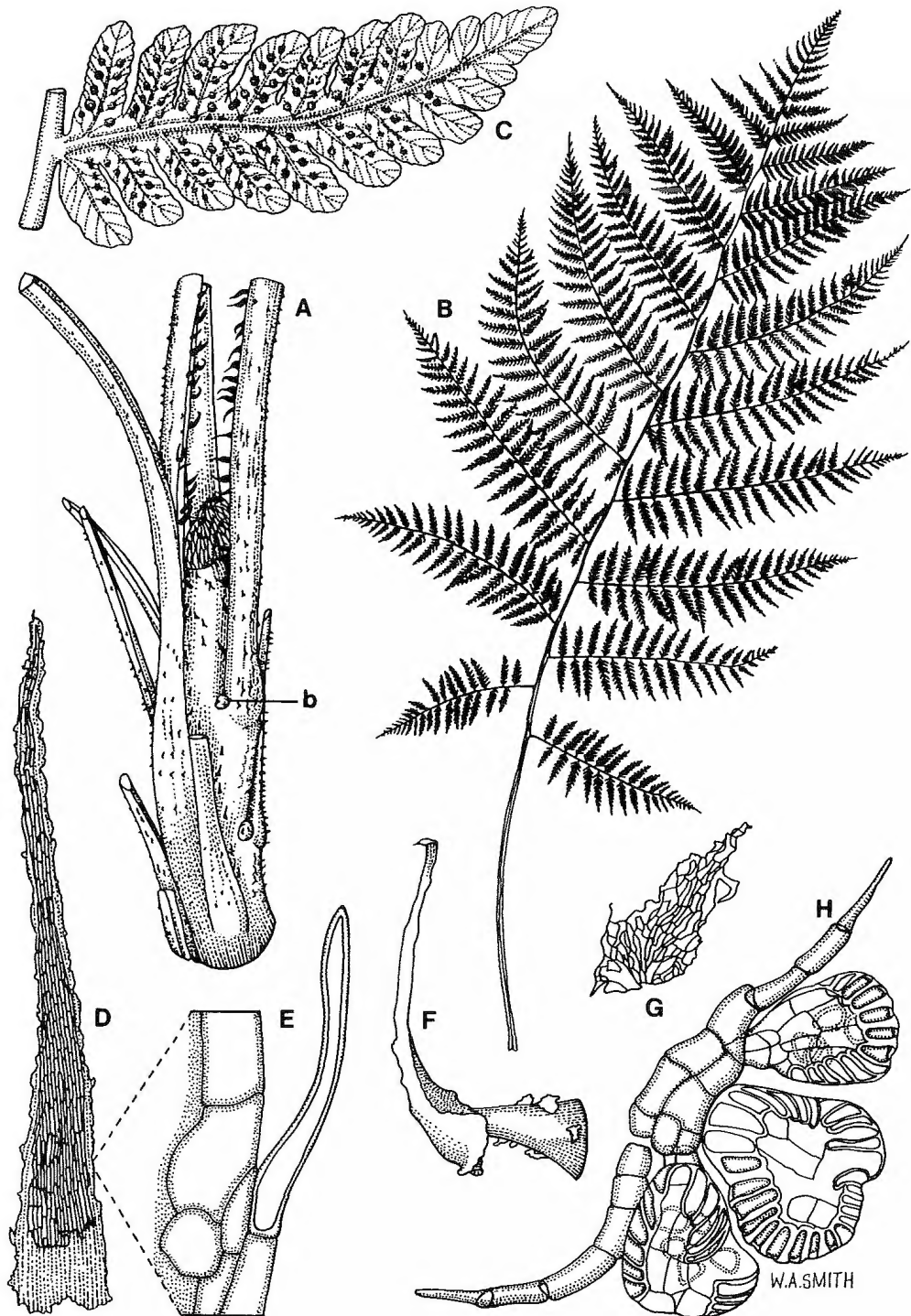


Fig. 1. *Cyathea exilis*: A. apex of caudex and stipe bases $\times 0.67$. B. frond $\times 0.17$. C. pinnule $\times 2$. D. stipe scale (surface view) $\times 12$. E. margin of stipe scale $\times 325$. F. spinule from stipe with attached scale (oriented as in life) $\times 12$. G. bullate scale from abaxial pinnule surface $\times 25$. H. sporangia and paraphyses $\times 130$. A, Kenning s.n. (from living plant); B, Forster *et al.* 4525 (drawn from pressed frond); C-H, Kenning s.n. (in spirit). B-H at BRI. (b - proliferous bud).

The habit of *C. exilis* reflects that of lowland populations of *Dicksonia youngiae* in southern Queensland, in growing in drainage basins under rainforest, but rarely with water lapping the trunk except during seasonal flooding. Constant humidity appears to be more of a controlling factor than the presence of running water.

The similarity of *C. exilis* with *D. youngiae* extends to the proliferous buds along the trunk, which can develop small fronds while on the living trunk, although it is more usual for a cluster of trunks to be produced at ground level around a living or dead parent trunk, or a line of new plants to develop along a fallen trunk. Broken or damaged trunks exhibiting this vegetative regeneration are relatively common in the field (Forster and Kenning, pers. comm.).

C. exilis is very closely related to *C. macgillivrayi* (Bak.) Domin of Papua New Guinea and Irian Jaya; indeed, apart from the longer paraphyses in the sori, and a less distinct pinnule dimorphism, *C. exilis* is to all intents identical to *C. macgillivrayi*. My examination of BRI specimens of *C. macgillivrayi* and an isotype specimen of *C. gracillima* Copel. (placed in the synonymy of *C. macgillivrayi* by Holttum, 1963) did not reveal any other significant morphological differences.

As regards the habitat requirements of *C. macgillivrayi*, most collections of it were from ridges on mainland New Guinea, as Holttum states, but at least one of the collection sites of *C. gracillima*, south-west of the Idenberg River, Irian Jaya, was described as 'a mountain-locked valley, swampy in places and drained by a considerable stream...' (Brass 1941). The specimen Brass 13489, from this locality, is recorded as 'plentiful on river flats' (Copeland 1947). The island collections of *C. macgillivrayi* (Louiadi Archipelago) are mostly from below 300 m altitude (Holttum 1963). Mainland New Guinea is not much closer to the Louisiade islands than to the site of *C. exilis* on Cape York Peninsula.

In spite of my comments above, I am disinclined to place *C. exilis* in synonymy with *C. macgillivrayi* at present. Living or spirit-preserved material, particularly of *C. macgillivrayi*, is essential to allow accurate comparisons of their morphology.

The illustration of the sporangia and paraphyses of *C. exilis* was made from alcohol-preserved pinnule fragments, bearing more or less mature sori (before any dehiscence had occurred); these fragments were mounted whole in Hoyer's medium.

Acknowledgments

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Peter D. Bostock

Queensland Herbarium, Meiers Rd, Indooroopilly, Qld 4068, Australia

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